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**Listing of Claims:**

This listing of claims replaces all prior versions and listings of claims in the application.

1. (Currently Amended) An n-type semiconductor diamond, characterized by a crystalline perfectness whereby making method comprised of:

it has impurity atoms constituted by sulfur atoms forming a single donor level of 0.38 eV,  
it has a carrier mobility's temperature dependency which at a temperature (T) range in excess of the room temperature is  $T^{3/2}$  dependent, and

it has a diamond peak in its Raman spectrum, whose half width is  $2.6 \text{ cm}^{-1}$ ;  
a crystalline perfectness whereby:

light emission by excitons is observable; and  
a crystalline perfectness whereby:

a distinct Kikuchi pattern in its reflection electron diffraction analysis is observable  
mechanically polishing a (100) diamond surface to make it in an inclined diamond substrate;

subjecting a surface of said inclined diamond substrate to a hydrogen plasma to make  
said substrate surface to consist of steps each in the order of an atomic layer; and

subjecting said substrate surface consisted of steps each in the order of an atomic layer to  
an excited raw material gas made of a volatile hydrocarbon compound, a sulfur compound and a  
hydrogen gas by a microwave plasma to cause n-type semiconductor diamond to grow  
epitaxially on said surface consisted of steps each in the order of an atomic layer,

wherein said n-type semiconductor has a single donor level of 0.38 eV, which is  
sufficient to allow operation of said n-type semiconductor diamond as p-n junction device.